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## Liquid crystal as chemical form and model of thinking in Alfred Döblin's modernist science

Esther Leslie

In 1933, Alfred Döblin, a novelist and doctor, published a long and complex book, titled *Unser Dasein*, (*Our Existence*).<sup>1</sup> *Unser Dasein* is a difficult book and has enjoyed nothing of the success of *Berlin Alexanderplatz*, but it is also a book that presents in a variety of ways – scientific, fictionalised, philosophical amongst others – a mode of thought characteristic of Döblin, in which a kind of monism is at work, whereby science and art, scientific approaches and artistic responses, are presented as equally appropriate, equally evocative, equally generative of knowledge and understanding. If one were seeking the model of a crossover and combination of scientific and artistic work recombined, *Unser Dasein* would yield a curious but productive one. It utilises the montage form not just or even predominantly in terms of splicing scenes or genres and disciplines. It deploys it in the sense of yoking together that which is often kept apart. In so doing, it perhaps evinces a much deeper absorption of and commitment to a then recently discovered – but still marginalised – chemical and theoretical form, the liquid crystal, a form which is discussed in the course of the book. It is as if it combines this strangely contradictory and improbable form, which is liquid and crystal at once, into its mode of presentation and into its vision of the world and the human as part and counterpart of a world.

*Unser Dasein* was written more or less contemporaneously with Döblin's city-novel *Berlin Alexanderplatz*, which had appeared in 1929. *Berlin Alexanderplatz* was a montage novel, a compiling of documents and bawdy songs, of bus timetables and scientific pronouncements, tram

routes, weather reports and stock exchange reports, radio broadcasts, mortality statistics, advertisements and melodramas from the press. In a 1930 review of Alfred Döblin's *Berlin Alexanderplatz*, titled 'Crisis of the Novel', Walter Benjamin argues that the novel can survive only if it adopts an epic, cinematic form.<sup>2</sup> Döblin's work gave an extension of life to the novel, set it on new grounds in the media age of technological reproduction. The traditionally isolated form of the novel – written and read alone – opens up to the technical imperative of the modern age and imports something of the mediated collectivity into its pages. Alfred Döblin had called for a cinema style in 1913 already. For Döblin, this meant writing characterised by what he termed urgency and precision, three-dimensionality and liveliness. In practice it meant a development of montage methods through the inclusion of non-literary, reproducible materials into the writing. Literature imports such cinematic devices that play with space and time – scene shifting, close-up or flashback. A new kind of writing arises here and it is one that deals less with self-expression and more with the rendering of objective, social reality, though it never relinquishes moments of flight into subjectivism, or even expressionistic exaggeration. 'Authentic reality', the stuff of life, is incorporated into the writing, or more, it is the story. The story is told through documents and urban ephemera. *Berlin Alexanderplatz* told the story of Franz Biberkopf, but it did so not as a communication from one individual about another.<sup>3</sup> Historically, the novel is a form, Benjamin maintains, in reflections on Döblin, that is written by a solitary and silent person, who cannot speak to the collective, but can only render individual experiences. What Döblin produces, in contrast, is a new form of epic, out of the fragmentations of montage: 'The montage explodes the framework of the novel, bursts its limits both stylistically and structurally, and clears the way for new, epic possibilities'. Benjamin understood *Berlin Alexanderplatz* to be specifically Berlinish, forged of its dialect and its streets, a 'low life Naturalism'. The novel absorbed the city, its technologies, bureaucracies, systems of governance and control into its language and its stories.

The contemporaneous book *Unser Dasein* similarly evaded generic definition. It reinvented form, presenting in its multiple modes of address, different linguistic registers and multiple disciplinary approaches, something unclassifiable. Like *Berlin Alexanderplatz*, it deployed montage, gleaning materials from widely differing sources. It deployed sudden cuts of scenes – cinematically again – in order to pursue not just the dissolution of the individual in the collective city experience that is Berlin, as *Berlin Alexanderplatz* had done, but rather something larger. *Our Existence* sought to pursue the origins of life in past times and the

remnants of something characterisable as the whole in each individual part, each part of life, each organic and inorganic fragment. The book is a five-hundred page investigation of life, society, nature's forms, subjectivity, aesthetics, religion, morality, time and suffering. Its title – *Our Existence* – indicated something of its ambition, for it promised a panoramic theory of life, specifically human life, though that implied all other lifeforms and inorganic ones too. Its overall title echoed those of Ernst Haeckel's hugely popular turn-of-the-century study, *The Riddle of the Universe*, with its sections on 'Our Bodily Frame'; 'Our Life'; 'Our Embryonic Development'; 'Our Monistic Religion'; 'Our Monistic Ethics'.<sup>4</sup> Its section titles had the ring of Haeckel's authoritative voice: for example, 'The Self and the World of Things', 'The Counterpart of Nature: The Three Peculiarities of the Self', 'Transition to the Collective: Of Hers and Individuals'. *Our Existence* was as grand in scale and conception, and about as little read, as Döblin's earlier science fiction novel *Berge Meere und Giganten* (*Mountains Seas and Giants*), from 1924, which imagined several thousand years of history, from the First World War onwards far into the future.<sup>5</sup> As in the course of the story, technology develops, the narrative describes large scale wars and smaller scale guerrilla wars, new machines and waves of neo-Luddism, the emergence of Shamanic societies and the return of oral storytelling. There is also the conquering of uninhabited lands. This last one demands the deliberate melting of Greenland's ice, through a harnessing of Iceland's volcanic energy, a process which reanimates prehistoric bones and plants. These fuse into monstrous and deadly hybrid forms. Like *Berlin Alexanderplatz*, *Mountains Seas and Giants* tries to render genre and language anew. Punctuation is missing and there is slipperiness between objects and subjects. The vast spans of time dealt within nine books means that there are no characters who carry over from sub-book to sub-book and there is no unity of place. It all threatens to dissipate.

*Unser Dasein* shares this sense of discontinuity. The themes of life, wherever life finds itself, are explored in the eight 'books' and three interludes of *Our Existence*, conveyed through a mix of poetic and scientific registers, slipping at various points into bawdy or infantile rhyme and deviated quotations which have been played around with. What unites these books is the approach from the perspective of 'natural philosophy'. Döblin works with a natural-philosophical conception, meaning that his work's scientific basis has a Romantic inflection. In order to engage with the sciences of the day, Döblin feels compelled to reach back to the scientific methods and insights of the Romantics who engaged in Natural Philosophy.<sup>6</sup> Alongside his fascination with German

Idealist Romanticism, Döblin evinced an interest in Spinoza's ideas. These presented him with a version of philosophical Monism, in which God and nature are one and Nature is released from any transcendent force that brings it into movement.<sup>7</sup>

In December 1927, Döblin published an article in the *Vossische Zeitung* under the title 'Outsiders of Natural Science'. Some of these had been dismissed as mystics and Romantics, but Döblin perceived them as 'the intellects of tomorrow', because they 'reach far enough backwards'.<sup>8</sup> Amongst their number were included the doctor and metaphysician Oskar Goldberg, the palaeontologist Edgar Dacque and the philosopher of harmony Hans Kayser. Each worked on the margins of science, speculating on the whereabouts of Atlantis or the magical origins of language and number. Döblin reaches to those who worked the span between, on the one hand, a subjective and in a sense romantically accented study of nature and, on the other, the pursuit of significant technical and scientific discoveries. In contrast to the separation often declared between scientific thought and poetic expression, Döblin evokes in his various writings a number of investigators, present in particular in Germany, in whom the proximity or identity of scientific thought and poetic expression, or scientific expression and poetic thought, was to the fore. This is what he reaches back to. But there is another reaching back. This is the reaching back to the origins of humans, the beginnings of nature. For the Romantics, as for Döblin, the beginnings lodge still in the ends. There is a quest for origins, but furthermore there is the denial of linear time, or better a denial of a simple idea of progress and the refinement of forms and the separation out of realms. Humans were once mineral, are still mineral. Minerals share characteristics of humans. Vegetables are rooted humans. Humans are rootless vegetables that have grown nerves and muscles and so on. Such a perspective is one that undermines another widely held idea of conventional science, the opposition between humans and nature. When undermined by Romanticism, a vision of nature out there is proposed, in which the plants, the rocks, the stars, are, like humans, the possessors of subjectivity and agency. With another inflection, a scientific one, a similar empathetic sense argues that plants, rocks and stars are composed of the same matter as us. In either case, a world of life, and even of non-life and life, in some sort of unity is proposed. This book was preceded by a book of similar tenor titled *Das Ich über der Natur*, a paean to connectedness of all things in the world, and the presence of a primal spirit or intellect that moves through all that exists in the world.<sup>9</sup>

And so in *Unser Dasein* Döblin argues that the animal is a mineral and, at the same time, the vegetable-animal form of the mineral. Animals

and minerals share forms, modes, processes and elements. Such forces are evident in the ways in which the universe rearticulates itself: the earth is warm, but covered by a hard stony crust. It is like the polar bear, covered with a layer of thick fur. 'The thought should be possible: The earth resembles those animals, or the earth is of the same kind as these animals'.<sup>10</sup> Döblin's Universalism considers the universe as a whole organism, each part affecting the others, just as the waxing and waning of the moon affects the sea and animals. Seeking the nature of humans, there is no definitive opposition between souled and unsouled beings, between matter and spirit, between the hard stony crust of the earth with its soft vegetation and the soft pliable skin that bounds the human, its bony skeleton within.

Döblin's mode of perceiving unity and connections has antecedents, specifically those who had affinities to Romantic natural philosophy and natural history. In an early English incarnation, it can be recognised in a book of natural history, begun in 1774, an eight volume work by the poet Oliver Goldsmith. It is titled *An History of the Earth and Animated Nature*. A Romantic work of scholarship, Goldsmith decided that the best way to depict the wonders of the natural world was 'to write from our own feelings and to imitate nature'.<sup>11</sup> In his book, nature, already described by others naturalists, is re-described through an observing eye whose look is informed by identification and empathy. If the first object of natural history is the apprehension of nature and its knowing, then the second object destabilises this, penetrates further into nature's realm in order to realise how much of nature is not known, or not fully known or is known in new ways, within an ever-widened prospect. The second – and real – object of natural history, inflected by philosophy, is the natural object remade in thought and imagination. This is the utopian axis of a nature infused by concept and idea and word. The title of Goldsmith's book relays something about a Romantic stance towards nature. The nature he writes of is animate, which at its simplest means that he wishes only to write of nature that can be described as alive, properly alive – as, for example, are plants and animals. But beyond that he also indicates his approach: that nature is precisely something spirited, as lively and interconnected and multiply related, sometimes through enmity, sometimes solidarity, across its chain of being. Animated nature is historical, changing over time, dynamic, and all the vital elements of the universe, from the highest, the human, to the lowest, the insects, are animated by spirit, which is to suggest – as Darwin makes clearer later – all of nature is unified by what Coleridge in 1796, in his poem 'The Eolian Harp', called 'the one Life within us and abroad'. Nature is us and we perceive parts of

ourselves reflected in all its elements. It was a perspective echoed in many thinkers, as for example, in Johann Gottfried Herder's *Outline of a Philosophy of the History of Humanity* (1784/91):

The more we learn of Nature, the more we observe these indwelling powers, even in the lowest orders of creatures, as mosses, funguses, and the like which almost inexhaustibly reproduces its own likeness, in the muscle, which moves briskly and variously by its own irritability, the existence of these powers cannot be denied: and thus all things are full of organically operating omnipotence. We know not where this begins, or where it ends; for, throughout the creation, wherever effect is, there is power, wherever life displays itself, there is internal vitality. Thus there prevails in the invisible realm of creation, not only a connected chain, but an ascending series of powers; as we perceive these acting before us, in organized forms, in its visible kingdom.<sup>12</sup>

For Döblin, there are echoes across all parts of the world and its various kingdoms. But his is also a philosophy of conflict. The self is in the world, part and not part of it. *Unser Dasein* was a reflection on the make-up of the I and the make-up of the world and the relations between the two. Is the world an illusion, invented by the self? Is the I formed only by its environment? Döblin's answer was a dialectical one, if poetic too:

It is not an illusory world, but a real world, but it has its reality in us. In the sea of being the temporal world is a wave. Or a pearl.<sup>13</sup>

There is *Sein* ('being') and *Dasein* ('existence'). There is *Leben* ('life') and *Erleben* ('experience'). Each of these is co-constitutive of the other. Experience occurs through time, like the moment of a wave rising, specifically out of the sea of being. Or it is like a formation – a pearl – a nugget that is made through time and passes away in time. The I arises or the I is made, two different accounts of how being might exist. The I experiences the world, reflecting it like a mirror, as it experiences it directly. In this regard it is a part of the world. But it also remains separate from it, a counter-part, which can withdraw into itself, experiencing its own transitoriness. It is both part of and part against nature. But even as it does this, the world acts on and with it. The self is an object for the world.

The first book of *Unser Dasein* has the heading 'The thing world and me'. The writer sits at his writing bureau in a study and inquires after the 'I', in relation to animals, objects, sounds, people, the world within and

outside. This I has a body comprised of nails, bones, teeth, eyes, ears, muscles and sinews. It also possesses a mess of organs. Hair propagates as if one were a mountain with trees on top of the head or a verdant meadow that must be regularly mowed. The I appears as a factory, an incubator, a business. But this factory of the body is also a carnal agent, which experiences and suffers, thinks and desires. *Leben* – life – has to *erleben* – experience. The I is drenched by the world and the world is unlocked again and again by the feeling, acting person. We, the I, everything is a part and a counter-part of nature. There is natural form and there is autonomy, but all takes place in the context of the universal principle of ‘resonance’, the interconnections back and forth between humans and their environment, a *Kraftfeld* (‘energy field’) within which life and experience occur.

After this introduction, a next section, titled ‘Summer Love’, explores social atomisation through the story of some lovers in the city. Its protagonist is a man in his thirties, a civil court judge, who is ‘an isolated frozen animal’. His self is exposed to an indication of its ‘transcendental homelessness’, as Georg Lukacs termed it in his work of 1916, *The Theory of the Novel*.<sup>14</sup> The self is aware of its loss of a place in the world and the loss of any greater purpose to existence, yet the desire to inhabit a home and to have meaning persists. The self is a forsaken being, alone in the world but his selfhood appears to be massified endlessly. He is not alone in his loneliness. In the course of his work, the protagonist falls in love with a happy-go-lucky woman. He melts, seems to himself to be rain, a stream, suffusing all things and people, sinking in an ocean of exhilaration and delight. It is as if he could kiss every mouth, gaze into all eyes. He feels ‘more elastic’. He learns to identify himself by entering into this voyage of yearning. The self is realised in an other. But what is also formed is one great collective woman who is loved and a community of lovers. Once he has reached this recognition, the woman who kindled the passion is long gone, and he has already seen her with her new beau. But his love is not quashed. He falls in love with their love, partaking in their desire. Love is fluid, flows with the streams of city life, which are powered by drives, in whirling spaces of the urban masses, in transport systems, beneath and within dynamic advertising. It is a passage into life.

Döblin moves from here to a section titled ‘The Unlocking of Nature’, which returns, in another way, to the themes of what the I is and how it exists in the world. Here he considers such topics as the plant in relation to what he calls the nerve-muscle human and he reflects on the possibility of love in plants and animals. World and I are recognised as ‘open systems’ that are incomplete and are always seeking completion, each by the



other. Completion is never reached. There is a drive to form and to completed form – this drive is utopian – but it is never finished. This is the dialectical tension that comprises life and experience. It takes its driving force from a sense of process that Döblin draws from his biological understanding. Another tension is at work too, a scientific one. Across his various writings a certain tension as to where life comes from, or what it means. Perhaps it is less a tension than the indication of an openness to concepts. Just as he sets life in a tension between the crystallising and dissolving aspects of formation, Döblin himself is caught between the mechanical theories of life as a result of chemistry and number, and the Vitalist ones, which insist on an innate building agency in the organic. The Vitalists, or ‘Neo-Vitalists’ as they were known from the turn of the century, ascribed life to a somewhat mysterious self-directed and indivisible force of nature. It was something like gravity or electricity or the newly discovered radioactivity. The Neo-Vitalists’ leading light was Hans Driesch who gave the universal life force a name: ‘Entelechy’, borrowed from Aristotle.<sup>15</sup> In opposition to this conception was the Mechanists’ claim that life was to be comprehended as an isolated chemical function occurring within a physical substance.

Between these poles exists Döblin’s natural-philosophical stance. In as much as it is dialectical, it might also be said to be evinced in his literary approach – exemplified in the varied modes of expression, of writing form, of disciplines and aspects, all elements of a whole that can never be made whole. The open system of the human pulls it always towards dissolution into the environment, and yet, against this, form continually asserts itself. The ‘innate tragedy of all formed things’ resides in this interplay of openness and integrity.<sup>16</sup> All form dissolves. But dissolution achieves new forms. Such is the book before us, much as it was, if more tentatively, the case with his other books.

In *Unser Dasein*, Döblin explores the relation between the I and the organic world. Original life was, he claims, vegetable, but the human, like most animals, eventually emerged as something unrooted. Such thinking is usefully contextualised within a wider scientific field of the time, a period in which intensive research was going on into vitamins and what researchers in Germany termed *biologische Wirkstoffe* (‘biologically active agents’), which were found in various substances, isolated, analysed and synthesised.<sup>17</sup> The unrootedness of the human-vegetable compelled the evolution of other organs to bolster the humans’ I – nerves and muscles. Despite this evolution of organs, he emphasises similarities across forms. The plant may have no mouth, stomach, intestine, but, like the person, it takes in nourishment, stores it or expels it. The plant knows

stimulation too, and movement – not enough to make it need those organs of nerves and limbs, but enough to make it close to us. Döblin considers inorganic nature too, observing that organic nature is comprised of inorganic elements. The human too is mineral and, like all things in nature, is involved in a dance with form, which is the province of the mineral, the crystal. What counts as an organ in the animal world takes, in the world of mineral, the shape of a space lattice. The principles of nature that generate form are, according to Döblin, rhythm, number and repetition. Such are the principles of crystal formation – but they extend into all organic living things, for example:

The expression of number in phyllotaxy, in the laws pertaining to the ordering of leaves on the stem, in the position of scales on a spruce cone. The ornamental forms of leaves.<sup>18</sup>

Number explains elements of form, or what might be termed the crystal side of life. And yet there is something that number does not capture. Experience is not accounted for wholly by number. Experience is fluid and unstable. Knowledge of details might not open up the experience of nature, he suggests, when he notes, in relation to water that we know to be made of repetitions of one hydrogen and two oxygen molecules:

From this formula one can never arrive chemically at the particular form or un-form of water.<sup>19</sup>

Döblin reflects on the relationships of cells and crystals through H<sub>2</sub>O, a peculiar form that can be hard as in a snow or ice crystal, or a fluid in the form of water. Abundant in the world, it is found in the cell too. Water yokes organic and inorganic worlds. Döblin considers regular, geometric formation, which is a characteristic of crystals, and observes it in plants and animals, such as spruce cones and radiolarians, corals, anthropods, worms, feathers, the compound eyes of bees and the symmetrical segmented forms of the inner organs of vertebrates. Beauty is inorganic form, with its patterning and regularity. Not just a spatial element, Döblin extends the principle of number and geometry to rhythmic movement in time, animals and astronomy. How could it be otherwise, he asks, when organic forms are composed of inorganic elements? We humans, who over time experience existence as sometimes stable and sometimes labile, that is, in German, *stabil* and *labil*, are made mainly of water, being moveable seas that must be constantly refilled. Everything is in formation. Even a squalid blur of smut has a crystalline

structure. But nothing in the world is finished. Everything is a fragment of something else.

Döblin elaborates a history of the world and the I. Light brought new life forms. Once the surface of the earth is heated enough by the sun, water is joined by protein jelly (*Eiweissgallerte*). From this amalgamation come animal and plant forms. The crystal forms that had dominated, with their harsh edges, are softened by water and made rounder. Once water and jelly exist, metabolism, the exchange of stuff, is essential. Osmosis, light: forms of life proliferate in water, and then on land. Protoplasm, a labile thing, liquid-like or jelly-like, is what emerges after a hard crystal epoch. Döblin describes jellies as miscarried crystals with an enormous will to become a crystal. But other circumstances in the swirly oceans reform the crystal and it becomes otherwise. Earth's crystal epoch is over as softer forms develop, though these forms that emerge can easily step back into a crystalline existence, can easily harden or mineralise once more. What is the crystal, Döblin asks rhetorically. His answer is that it is the fighting form of matter against fire and water, those fluid, consuming forms. Life forms form themselves against water – non-dissolvable, waterproof – by forming skins. They become, in so doing, in developing cells, crystalline, to some degree. And so Döblin outlines a vision of a universe that is reflected in all its parts in us: We are composed of animal, vegetable, mineral, planetary forms. It is not sequential – we were not once planet, then crystal, cell, plant, animal and, finally, human. Everything is a part of us still. Time is shattered.

In Döblin, the purpose of existence is the 'continuation of forming'. This is a simple procedure for the crystal, but a difficult effort for the 'plasma being', with its organs and its movements. But as a final point the whole lot inclines towards stiffening – *Erstarrung*. The watery states of the plasma beings account for that, as they have the capacity to freeze. Forms harden over time, and such hardening is a movement towards death, but it is also part of the process of new lives forming. The crystal achieved this state very early in its existence, hardening out of the melting flow. Petrified existence is also a part of life, in its mineral expression.

In Döblin, the liquid and the crystal are brought together, exchange properties, exist in a dance. Such proximity of liquid and crystal forces had been made available scientifically in Germany since 1888, when a momentary phase of liquid crystallinity was caught in view for the first time. Liquid crystals were closely observed, if unnamed, in 1888 when an Austrian chemist and botanist in Prague, at the Institute of Plant Physiology, named Friedrich Reinitzer, experimented with cholesterol of carrots in the form of cholesteryl benzoate and cholesteryl acetate.

It appeared that this substance could melt into a liquid as the temperature increased, but also he discovered that in its cloudy phase it polarised light in the way that a crystal does, that is it refracts it twice, in different directions. Colours flashed up during phase transitions. Reinitzer had to conclude that the substance seemed to be crystalline and liquid at one and the same time. Furthermore, these crystal-like things ‘melted’ during cooling. Reinitzer was perplexed and passed his findings to a physicist in Germany, Otto Lehmann. Reinitzer and Lehmann exchanged letters and samples by post.<sup>20</sup> They pondered what might be at work as the bright colours briefly flashed up. Lehmann was adept with a microscope and the first task was to examine the substances closely using his home-built one, a crystallisation microscope, with polarisers and a moveable object table. Later, he integrated micro-photographic and screening mechanisms into the microscope, making it possible to reproduce and objectify that which the eye could perceive and so make it available to others and to research and classification. Lehmann continued studying this form his life long. Lehmann wrote under the influence of the biologist Ernst Haeckel, who, reciprocally, on hearing about liquid crystals as an old man, deemed them to be the missing link between inorganic and living systems and devoted his final work, *Crystal Souls: Studies of Inorganic Life*, to them in 1917. Other researchers perceived in liquid crystals something crucial, indeed, something that was set at the heart of life and conceptions of life. A paper published in German and English in 1930, by Friedrich Rinne, provided a pithy image of such thinking. Titled ‘Sperm as Living Liquid Crystal’, its abstract asserted:

It is customary to draw the boundary between living organic and inorganic matter so that crystals represent the highest form of inorganic material and low organisms form the beginning of the organic world, with a definite and deep physiological gap between the two categories. In my opinion, this gap does not exist, since the sperms, which are undoubtedly living, are at the same time liquid crystals.<sup>21</sup>

Döblin knew like many other scientists of the time of Ernst Haeckel’s pinning of the liquid crystal as the intermediate form between organic and inorganic life in his book ‘Crystal Souls’, but he absorbed similar ideas more directly through the work of his contemporary Hans Kayser, a theorist of harmony. Harmony, Kayser conceived, as the connecting element between the material and the mental world, the physical and the metaphysical. Döblin owned a copy of Kayser’s *Orpheus: Morphologische*

*Fragmente einer allgemeinen Harmonik*, which was printed in a handful of copies in Berlin in 1924.<sup>22</sup> Notions of resonance were undoubtedly provoked by Kayser's assertion of harmonics and his interest in waves of sound and the matter waves of the new quantum physics. The centrality of the crystal was also affirmed by him, as basis of life and as harmonic form. A rhythmic principle expresses itself in developmental stages from crystal to plant to animal. Kayser asserted the existence of mathematical laws, in these various forms. Nature creates and humans can observe these creations in relation to harmonic intervals and numerical patterns. The discovery of liquid crystal makes clear to him the threads of connection between inanimate and animate worlds, though he is keen also to emphasise the dividing lines. Kayser was a reader of the Romantic experimenter J.W. Ritter, who was in Jena around 1800, in contact with Romantic natural philosophers and poets. Ritter, using his own body as a testing ground, eventually fatally in 1810, worked on notions of polarity in relation to light and electricity. Kayser also knew of Otto Lehmann, the man who had discovered liquid crystals in 1888, and held to them as other scientists demurred.

Döblin's book goes on to explore ethics and art, questions of free will, the flow of time and causality. Art is a manifestation of the desire for recognition of resonance, even as the I struggles not to be melted into the earth. Through art, the human discovers connections to the basis of the world and the self. Art speaks to the inorganic composition of humans and never more so, apparently, than in Döblin's time, the time of the Modern Art movements, as he draws for his argument on Cubism, Constructivism and abstraction.<sup>23</sup> These mobilise number, rhythm, the formed, all that which is inorganic. Art, for Döblin, is primarily a re-remembering of the non-human forces of formation in the human. Artworks strengthen our vegetable, crystalline, inorganic substance. Art is something that aims at the completion of our incomplete selves. It does not achieve it.

The book continues with reflections on human types and behaviour, with reflections on modes of love affairs, suicide, and questions of collectives, herds and individuals, including the 'Jewish Volk-Nichtvolk', which he interpreted from the perspective of suffering'.<sup>24</sup> Here in these analyses of peoples he draws in the phenomenon of paragenesis, the mode whereby contact between mineral deposits affects each other's formation. The touching points between entities produce form. Döblin applies it to the people, arguing that the environment marks itself on physiognomy, gesture and stance. Bodies are formed by social and historical forces, as tracts are in minerals.<sup>25</sup>

The final book examines the peoples of the occident and their mode of rule by powerful states, which become like monsters with uncontrollable organs. Poised before an economic catastrophe, it is set against the free development of the I, which is always a collective subject, a we, and which as such makes the world with nature. But what exists is capitalism, which needs profits and melds needs to their ends, and thereby the entrepreneur reforms the whole of humanity biologically. Against this is set hundreds of years of class struggle, culminating, in Germany, in 1918–19 and the attempted social revolution. From the writer at his desk to the fertile anarchy of revolution,<sup>26</sup> Döblin has answered the question of what is the I, variously, biologically, socially, psychologically, chemically, emotionally, politically and cosmically.

The liquid crystal view of things and self – a dialectical, historical materialist view – might be counterposed to an undialectical, ahistorical idealist view, which arises in the same period. This is embodied in the Fascist insistence, in various registers, on the crystalline. In those ideas that burgeoned happily in the environment of the Third Reich, there was a tendency to donate high value to the crystal. The imagined crystal of the Third Reich is solid and unchanging. It takes the place of life, instead of being a form of life. This may be found variously in the mountain film genre, many of which were directed by Aropnold Fanck and starred the actress Leni Riefenstahl.<sup>27</sup> The crystalline view is present in Arctic myths of Aryan origin, and in the Nazi approved Cosmic Ice Theory of Hanns Hoerbiger.<sup>28</sup> This glacial cosmology became the popularly accepted cosmology of the Third Reich, after Hörbiger's death in 1931. It gained political backing from Himmler, who thought that Aryans had reached Earth from the skies in sperms preserved in the Cosmic Ice. Hitler intended to commemorate the theory in a building designed by Albert Speer, in Linz. The building was to showcase three world pictures: Ptolemy's, Copernicus's and the Cosmic Ice Theory. The theory received institutional backing in Himmler's research organisation *Ahnenerbe* ('ancestral heritage'), which sought to elaborate pre-Christian practices and beliefs. Towards the end of the 1920s, Cosmic Ice Theory began to be framed as the 'German antithesis' to the 'Jewish' theory of relativity.<sup>29</sup> The polar theories evoked in the Third Reich do not include polarity within their own epistemological field, for they set their resources against melting and mixing. Metaphorically, Fascism favours the moment of ice, of freezing, of the pure white driven snow, the North, the cold.

A contemporary of Döblin's, Ernst Jünger, a warrior Fascist, wrote a treatise titled *Der Arbeiter: Herrschaft und Gestalt* (*The Worker: Domination and Gestalt*), in 1932. It set terms that the coming Nazi regime of 1933

came closer to fulfilling than the democratic one that preceded it. Modern existence, Jünger argues, has produced change and unrest, but it will be succeeded by a settling of all into a landscape that 'is more constructive and dangerous, colder and more luminous'.<sup>30</sup> The crystalline wins out. All change is solidified into order, a steely, cool order, in which humanism is evacuated. All cosiness has disappeared. It is possible already, in this world of the early 1930s, he notes, to traverse areas that are like 'dead moonscapes, governed by a vigilance that is as invisible as it is omnipresent'.<sup>31</sup> Here is the proper home of the mobilised worker. This is a worker who is something like a combination of soldier and machine, militarised and industrialised, and it is one who will develop a sensibility for the 'icy geometry of light'. This worker-warrior had survived the trenches of the First World War and knew how to operate under chaotic conditions. This worker-warrior is a 'type', and, as one type crystallises, another should be condemned to melt into history:

The mass is in essence amorphous, and therefore the purely theoretical equality of individuals, which are its building stones, is sufficient. In contrast, the organic construction of the twentieth century is a formation of a crystalline kind, and therefore it demands of the type that occurs in it, quite a different measure of structure.<sup>32</sup>

In the nineteenth century, Jünger argues, the mass was constant and the individual was variable. In the twentieth century, the mass, the formations of life, the situations that demand energy and participation, are variable, while the individual is constant. In this context, he claims, mathematics, or number, comes to play a greater role in life, as a socially organising force.

The crystal is an ideal object. The crystal is the form that evinces picture-perfect symmetry, against modern chaos. The crystal is a symbol of a well-formed, regular, transparent world. Complete symmetry signals death. The mobilised life is a life that stares death constantly in the face.

In any case, where Jünger thrived, if critically, Döblin's universalism finds no resonance at all in Nazi Germany. When *Our Existence* appeared in April 1933, Döblin was already in Zurich, in exile. His writings were not banned until 1935, so the book escaped the flames, but it died the death of being unread. It met a world where hardness is a virtue and

where the human is made into matter that can be formed into ornaments in rallies and on the battlefield, and does not form itself, liquidly and crystallinely, out of enlivened matter, out of the conscious and exuberant intermingling of humans and environment.

## Notes

- 1 Alfred Döblin, *Unser Dasein* (Munich: Deutscher Taschenbuch Verlag, 1988).
- 2 See Walter Benjamin's 'Krisis des Romans; Zu Döblins *Berlin Alexanderplatz*', *Gesammelte Schriften*, vol. III (Frankfurt: Suhrkamp, 1992 [1930]), 230–236.
- 3 Alfred Döblin, *Berlin Alexanderplatz: Die Geschichte vom Franz Biberkopf* (Munich: Deutscher Taschenbuch Verlag, 2002).
- 4 Ernst Haeckel, *Die Welträthsel: Gemeinverständliche Studien über monistische Philosophie* (Bonn: Strauß, 1899). In English: *The Riddle of the Universe*.
- 5 Alfred Döblin, *Berge Meere Giganten; Ein Roman* (Berlin: Fischer, 2013).
- 6 For one study of Döblin as 'natural philosopher', see the contribution by Roland Dolinger, 'Alfred Döblins Naturphilosophie in den Zwanziger Jahren', in *Philosophia naturalis: Beiträge zu einer zeitgemässen Naturphilosophie*, ed. Thomas Arzt, Roland Albert Dollinger, and Maria Hippus-Gräfen Dürckheim (Würzburg: Königshausen & Neumann, 1996), 135–150.
- 7 See Dolinger, 'Alfred Döblins Naturphilosophie', 137.
- 8 See Thomas Keil, *Alfred Döblins 'Unser Dasein': Quellenphilologische Untersuchungen* Würzburger Beiträge zur Deutschen Philologie, vol. xxix (Würzburg: Königshausen & Neumann, 2005), 118. For another setting of Döblin's ideas within their context and in relation to influence of 'Lebensphilosophie', in particular Bergson, Nietzsche, Driesch and Plessner, see Ursula Elm, *Literatur als Lebensanschauung. Zum ideengeschichtlichen Hintergrund von Alfred Döblins 'Berlin Alexanderplatz'* (Bielefeld: Aisthesis, 1991).
- 9 For discussion of this text, and its efforts to integrate scientific discoveries into metaphysical speculations, see David Midgely, in 'Metaphysical Speculation and the Fascination of the Real: On the Connections between Döblin's Philosophical Writings and his Major Fiction before *Berlin Alexanderplatz*', in *Alfred Döblin: Paradigms of Modernism*, ed. Steffan Davies and Ernest Schonfield (Berlin: Walter de Gruyter, 2009), 7–27.
- 10 Döblin, *Unser Dasein*, p. 139.
- 11 Oliver Goldsmith, 'Preface', *A History of the Earth and Animated Nature*, Vol. 1. (London: Wingrave et al., 1805), p. xiii.
- 12 Johann Gottfried Von Herder, *Outlines of a Philosophy of the History of Man*, trans. T. Churchill, vol. 1 (London: J. Johnson), 191.
- 13 Döblin, *Unser Dasein*, 132.
- 14 Georg Lukacs, *The Theory of the Novel* (London: Merlin Press, 1963), 70.
- 15 See H. Driesch, *Geschichte des Vitalismus* (Leipzig: Verlag von Hans Ambrosius Barth, 1922).
- 16 Döblin, *Unser Dasein*, 97.
- 17 For discussion of this see the introduction to Alexander von Schwerin, Heiko Stoff, and Bettina Wahrig, eds., *Biologics: A History of Agents Made From Living Organisms in the Twentieth Century* (London: Pickering & Chatto, 2013).
- 18 von Schwerin, Stoff, and Wahrig, *Biologics*, 123.
- 19 von Schwerin, Stoff, and Wahrig, *Biologics*, 121.
- 20 Peter M. Knoll and Hans Kelter, *Otto Lehmann. Erforscher der flüssigen Kristalle. Eine Biographie mit Briefen an Otto Lehmann* (Frankfurt: Ettligen, 1988), 50.
- 21 Letters to Editor, *Nature* 126 (23 August 1930): 27.
- 22 Keil, *Alfred Döblins 'Unser Dasein'*, 117.
- 23 Döblin, *Unser Dasein*, 245.
- 24 For a discussion of its status, see Keil, *Alfred Döblins 'Unser Dasein'*, 52ff. See also Hans Otto Horch's introduction to Alfred Doeblin's *Schriften zu jüdischen Fragen*, (Munich: Deutscher Taschenbuch Verlag, 1997), 7–78 and Klaus Mueller Salget, 'Döblin and Judaism' in Roland Albert Dollinger, Wulf Köpke, Heidi Thomann



- Tewarson, eds., *A Companion to the Works of Alfred Döblin* (Camden House, NY, 2004), 233–246.
- 25 Salget, 'Döblin and Judaism', 353.
- 26 For a survey of Döblin's political stances during the years of the Weimar Republic, see Wulf Koepke's 'Döblin's Political Writings during the Weimar Republic', in *A Companion to the Works of Alfred Döblin*, ed. Roland Albert Dollinger, Wulf Köpke, Heidi Thomann Tewarson (New York: Camden House, 2004), 183–214. For Döblin's retrospective sense of the German Revolution of 1918, see Michael W. Jennings, 'Of Weimar's First and Last things: Montage, Revolution, and Fascism in Alfred Döblin's *November 1918* and *Berlin Alexanderplatz*', in *Politics in German Literature*, ed. Beth Bjorklund and Mark E. Corey (New York: Camden House, 1998), 132–152.
- 27 See a recounting of some of this in Leni Riefenstahl, *Kampf in Schnee und Eis* (Leipzig: Hesse & Becker, 1933).
- 28 For further explorations of the rise of snowy visions in the Third Reich, see Friedrich Paul Heller and Anton Maegerle, *Thule: Vom völkischen Okkultismus bis zur Neuen Rechten* (Stuttgart: Schmetterling, 1998), 72ff.
- 29 Heller and Maegerle, *Thule: Vom völkischen Okkultismus bis zur Neuen Rechten*, 72ff. See also Milena Wazeck, *Einstein's Opponents: The Public Controversy about the Theory of Relativity in the 1920s*, trans. Geoffrey S. Coby (Cambridge: Cambridge University Press, 2014).
- 30 Ernst Jünger, *Der Arbeiter: Herrschaft und Gestalt* (Stuttgart: Metzler, 2014), 175.
- 31 Jünger, *Der Arbeiter: Herrschaft und Gestalt*.
- 32 Jünger, *Der Arbeiter: Herrschaft und Gestalt*, 145.